

**INSTALLATION INSTRUCTIONS FOR MASONRY CHIMNEY VENT ADAPTER KIT  
 (18M7901) USED WITH 80AF1UH, ML180UH, EL280UH and SL280UH UNITS**

**Shipping and Packing List**

**Package 1 of 1 contains:**

- 1 - Vent adapter assembly
- 1 - Template

**Application**

The masonry chimney vent adapter kit allows venting of 80 percent efficient furnaces into a tile-lined masonry chimney without the use of a listed metal lining system. The vent adapter assembly introduces dilution air into the flue gases, thus lowering the dew point of the gases and inhibiting the production of condensation.

This vent adapter is designed for use with 80AF1UH, ML180UH, EL280UH and SL280UH units installed in upflow air discharge applications. The kit may be used with furnaces fueled by either natural gas or LP/propane gas. Refer to table 1 for a complete listing of the furnaces with which this adapter kit may be used.

This kit has been CSA International certified for use with 80AF1UH, ML180UH, EL280UH and SL280UH furnaces when installed in accordance with these instructions.

The furnace must be installed in accordance with all national and local building codes or, in the absence of local codes, with the National Fuel Gas Code NFPA 54/ANSI Z223.1 (latest edition) and other applicable codes. In Canada, installation must be in accordance with the National Canadian Installation Code CAN/CGA B149.1 OR B149.2 (latest edition) and other applicable codes.

This vent adapter kit has been designed and tested for use with 80AF1UH, ML180UH, EL280UH and SL280UH units installed in masonry chimney vent applications in accordance with limitations set by NFPA 54 and the International Mechanical Code. **The included vent tables and guidelines must be followed exactly to ensure proper vent and unit operation and to minimize chimney wet time.**

Table 1 also lists the minimum allowable winter design temperatures for each model when used with the vent adapter. The map in figure 1 provides winter design temperatures for the contiguous United States. Portions of this document are reprinted with permission from NFPA 54: National Fuel Gas Code ©1999, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association on the referenced subject, which is represented only by the standard in its entirety.

**TABLE 1  
 Minimum Winter Design Temperatures for Use with  
 80AF1UH, ML180UH, EL280UH and SL280UH  
 Furnaces with Vent Adapter Kit in Both Interior and  
 Exterior Masonry Chimney Applications**

Minimum Winter Design Temperature* °F (°C)		
All Models	Interior Chimney	-10° F (-23° C)
All Input Sizes	Exterior Chimney	+5° F (-15° C)

*\*Refer to 99% Minimum Winter Design Temperature table provided in the current edition of the ASHRAE Fundamentals Handbook.*

**Installation Checklist**

- |  |  |
|--|--|
| <ul style="list-style-type: none"> <li><input type="checkbox"/> Verify furnace model numbers approved for use with kit (table 1).</li> <li><input type="checkbox"/> Verify that winter design temperature is appropriate for application of kit (table 1 and figure 1).</li> <li><input type="checkbox"/> Verify condition of chimney.</li> <li><input type="checkbox"/> Measure chimney height and inside area of lined chimney.</li> <li><input type="checkbox"/> Verify chimney and vent connector size (tables 3, 4 and 5).</li> </ul> | <ul style="list-style-type: none"> <li><input type="checkbox"/> Install vent adapter kit (page 6).</li> <li><input type="checkbox"/> Connect blocked vent switch wiring (figure 5, page 7).</li> <li><input type="checkbox"/> Test blocked vent switch.</li> <li><input type="checkbox"/> Test for proper draft and check for spillage (page 8).</li> <li><input type="checkbox"/> Place furnace into operation (page 8).</li> </ul> |
|--|--|



### 99% Winter Design Temperatures for the Contiguous United States



This map is a necessarily generalized guide to temperatures in the contiguous United States. Temperatures shown for areas such as mountainous regions and large urban centers may not be accurate. The data used to develop this map was taken from the 1993 ASHRAE Fundamentals Handbook (Chapter 24, Table 1: Climate Conditions for the United States). This map has been reprinted with permission from NFPA 54: National Fuel Gas Code ©1999, National Fire Protection Association, Quincy, MA 02269. This reprinted material is not the complete and official position of the National Fire Protection Association on the referenced subject, which is represented only by the standard in its entirety.

**FIGURE 1**

Table 2 lists winter design temperatures for some of the major U. S. cities.

**TABLE 2**  
**Minimum Winter Design Temperatures of Major U. S. Cities**

City	Minimum Winter Design Temperature -- °F (°C)
Baltimore	+10°F (-12°C)
Boston	+6°F (-14°C)
Chicago	-8°F (-22°C)
Columbus, OH	0°F (-18°C)
Des Moines	-10°F (-23°C)
Detroit	+3°F (-16°C)
Kansas City	+2°F (-17°C)
New York	+11°F (-12°C)
Philadelphia	+10°F (-12°C)
Pittsburgh	+1°F (-17°C)
Salt Lake City	+3°F (-16°C)
St. Louis	+2°F (-17°C)

#### Requirements

The room temperature surrounding the furnace and vent connectors must be at least 60°F (16°C).

The space surrounding the furnace must not be depressurized by more than 0.2" w.c. below the outdoor pressure (caused by exhaust fans, clothes dryers, etc.) Furnace capacity must not exceed 1.7 times the calculated heating load.

Sea level input ratings should be used when determining maximum capacity for high altitude installation.

If the furnace is to be vented into an exterior chimney, the furnace must share a common vent with at least one draft hood-equipped appliance to prevent condensation in the masonry chimney.

If the furnace is to be vented into an interior chimney, the furnace may be vented as a single appliance or into a shared vent.

#### Chimney and Vent Connector Requirements and Sizing

The masonry chimney vent adapter kit may only be used in applications which include vent exit through the furnace top cap. Applications which require side vent exit are not permissible.

When two or more appliances are vented into a single masonry chimney, the flow area of the largest section of vertical vent shall not exceed seven times the flow area of the vent adapter outlet or draft hood outlet, **whichever is smaller**, unless the vent is designed in accordance with approved engineering methods.

The maximum recommended chimney height in all applications which include the vent adapter is 35 feet (10.6m).

Vent connector from the vent adapter to the tile-lined chimney must be constructed of type B, double-wall vent pipe.

The furnace vent connector rise shall not exceed 3 feet (.9m).

Vent connector lateral length must not exceed 18" (457mm) for each inch of vent connector diameter. For example, a 6" (152mm) diameter vent connector would have a maximum lateral length of 9 feet (2.7m).

Vent connectors should not be sized more than two sizes greater than the listed appliance categorized vent diameter, flue collar diameter, or draffhood outlet

diameter.

The vent sizing tables allow for two 90° turns. For each additional turn, or equivalent, reduce the maximum capacity listed in the venting tables by 10 percent (.90 X maximum table capacity).

Interpolation is permitted when calculating capacities for vent dimensions that fall between table entries; however, extrapolation beyond the table entries is not permitted.

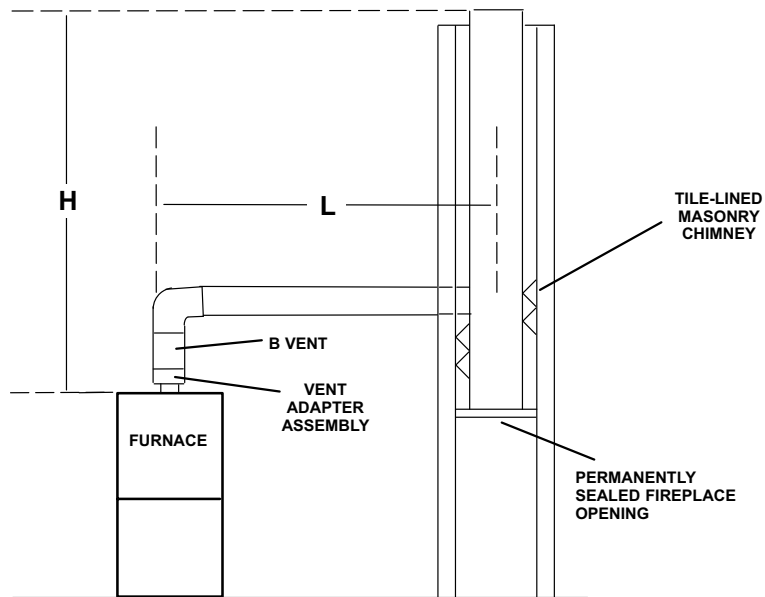
Size the chimney and vent connector per table 3 and figure 2 when a single appliance is being vented into an interior masonry chimney. Size the chimney and vent connector per tables 4 and 5 and figure 3 when using an interior or exterior masonry chimney as a common vent serving multiple appliances.

Use table 6 to determine the equivalent area of masonry chimney liners.

**TABLE 3  
Interior Masonry Chimney Only**

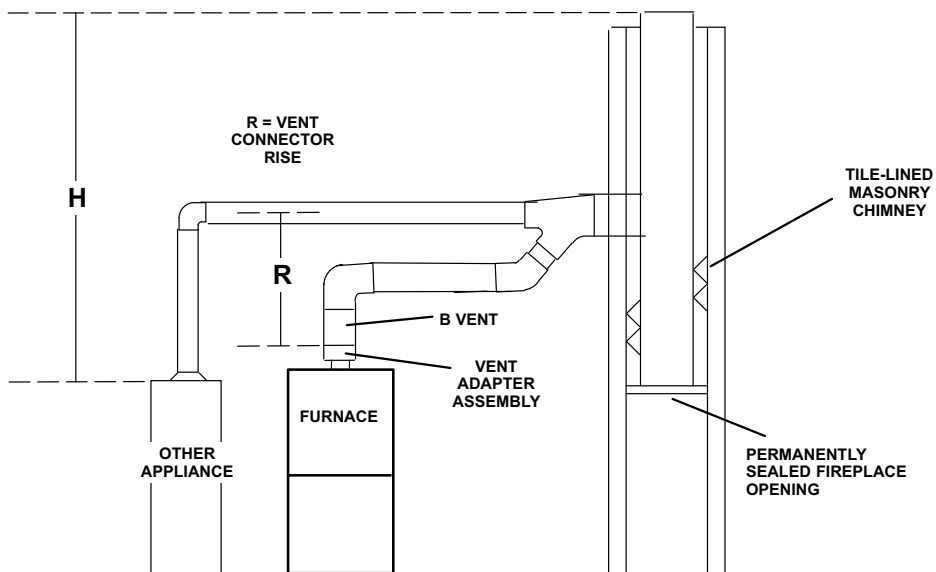
<b>Type B Double Wall Vent Connector Serving a Single 80AF1UH, ML180UH, EL280UH or SL280UH Furnace with Masonry Chimney Vent Adapter Kit</b>				
Vent Height H (ft)	Lateral L (ft)	<b>Type B Double Wall Vent Connector Diameter - (inches) to be used with chimney areas within the size limits at bottom</b>		
		6 in.	7 in.	8 in.
		Appliance Input Rate in Thousands of Btu per Hour		
		NAT Max	NAT Max	NAT Max
6	2	130	180	247
	5	117	165	231
8	2	145	198	266
	5	134	183	247
	8	127	175	239
10	2	162	221	298
	5	148	204	277
	8	139	191	263
15	2	179	250	336
	5	164	231	313
	10	153	216	296
	12	148	210	290
20	2	210	274	375
	5	184	254	350
	10	172	237	332
	12	167	230	325
30	2	216	303	421
	5	198	281	393
	10	184	263	373
	12	179	255	365
35	2	225	315	435
	5	206	291	406
	10	192	273	386
	12	186	265	378
<b>MASONRY CHIMNEY INTERNAL AREA</b>				
Minimum internal area of chimney (in. <sup>2</sup> )		38	50	63
Maximum internal area of chimney (in. <sup>2</sup> )		198	269	352

**Type B Double Wall Vent Connector with Interior Tile-Lined Masonry Chimney Serving a Single 80AF1UH, ML180UH, EL280UH or SL280UH Furnace Equipped with Vent Adapter Kit**



**FIGURE 2**

**Type B Double Wall Vent Connector with Interior or Exterior Tile-Lined Masonry Chimney Serving a Single 80AF1UH, ML180UH, EL280UH or SL280UH Furnace Equipped with Vent Adapter Kit and One or More Drafthood-Equipped Appliances (Typical Application Shown)**



**FIGURE 3**

**TABLE 4**  
**Multiple Appliance for Interior and Exterior Masonry Chimney**

<b>Type B Double Wall Vent Connectors Serving a Single 80AF1UH, ML180UH, EL280UH or SL280UH Furnace with Masonry Chimney Vent Adapter Kit and One or More Drafthood-Equipped Appliances</b>				
<b>Vent Height H (ft)</b>	<b>Connector Rise R (ft)</b>	<b>Type B Double Wall Connector Diameter - (inches)</b>		
		6 in.	7 in.	8 in.
		<b>Appliance Input Rate in Thousands of Btu per Hour</b>		
		NAT Max	NAT Max	NAT Max
6	1	101	141	201
	2	124	173	232
	3	143	203	270
8	1	105	148	210
	2	127	179	240
	3	145	206	276
10	1	108	153	216
	2	129	184	247
	3	148	209	281
15	1	114	164	229
	2	134	192	260
	3	153	215	292
20	1	119	173	239
	2	138	199	270
	3	157	222	301
30	1	127	187	255
	2	145	209	287
	3	163	233	317
35	1	131	194	265
	2	149	216	297
	3	167	240	332

**TABLE 5**  
**Multiple Appliance for Interior and Exterior Masonry Chimney**

<b>MASONRY CHIMNEY INTERNAL AREA</b>			
<b>Height H (ft)</b>	<b>Minimum Internal Area of Chimney (Square Inches)</b>		
	38	50	63
	<b>Combined Appliance Input Rating in Thousands of Btu Per Hour</b>		
	NAT +NAT	NAT +NAT	NAT +NAT
6	103	143	188
8	119	163	218
10	131	177	236
15	152	212	283
20	172	243	325
30	198	278	381
35	NR	291	401

NR - Not recommended for vent configuration.

**TABLE 6**  
**Equivalent Area of Masonry Chimney Liners**

Nominal Liner Size (inches X inches)	Inside Liner Dimensions (inches)	Inside Diameter or Equivalent Diameter (inches)	Equivalent Area (square inches)
4 X 8	2-1/2 X 6-1/2	4	12.2
		5	19.6
		6	28.3
		7	38.3
8 X 8	6-3/4 X 6-3/4	7.4	42.7
		8	50.3
8 X 12	6-1/2 X 10-1/2	9	63.6
		10	78.5
12 X 12	9-3/4 X 9-3/4	10.4	83.3
		11	95
12 X 16	9-1/2 X 13-1/2	11.8	107.5
		12	113
		14	153.9
16 X 16	13-1/4 X 13-1/4	14.5	162.9
		15	176.7
16 X 20	13 X 17	16.2	206.1
		18	254.4
20 X 20	16-1/2 X 16-3/4	18.2	260.2
		20	314.1

**Inspection of Tile-Lined Masonry Chimney**

The chimney must be inspected and found to be in good condition. Chimney construction must conform with the National Fuel Gas Code NFPA 54/ANSI Z223.1, Standard for Chimneys, Fireplaces, Vents and Solid-Fuel-Burning Appliances ANSI/NFPA 211, and to any applicable state or local codes.

The following conditions must be confirmed before continuing with installation of the vent system:

- Chimney must be lined with clay tile.
- Chimney crown must be in good condition. Missing mortar or brick must be replaced.
- Tile liner and top seal must be in good condition. If necessary, make repairs.
- All debris (mortar, tile, fuel oil residue, etc.) must be removed from chimney clean out.
- Tile liner must be inspected to make sure that tiles are properly aligned, that all sections are complete and that there are no gaps. If necessary, make repairs.
- Exterior chimneys must serve at least one other draft-hood-equipped appliance. Verify before continuing.

- Chimney must be properly sized per these instructions.

**Installation**

- 1 - Turn off all gas supply and electrical power to unit.

**⚠ WARNING**

**These instructions must be followed exactly. This kit must be installed by a qualified service technician. Improper installation may result in personal injury, loss of life, equipment damage, or damage to the existing masonry chimney.**

- 2 - A 7/8" diameter hole is required to accommodate the conduit for the wiring from the blocked vent switch in the vent adapter to the pressure switch in the furnace. A template is provided to ensure proper location of the hole in the unit top cap.

**The conduit hole must be positioned carefully to avoid contact between the blocked vent switch wiring and the combustion air inducer or hot surfaces inside the furnace.**

The 7/8" diameter hole for the electrical conduit can be located in three different locations in the top cap depending upon which furnace model that the vent adapter is being applied. The three locations are labeled A, B, and C on the Vent Adapter Kit Conduit Placement Template included with the kit.

Location A is for EL280UH and SL280UH models with the following gas inputs: 070, 110, 135 and SL280UH090V60C

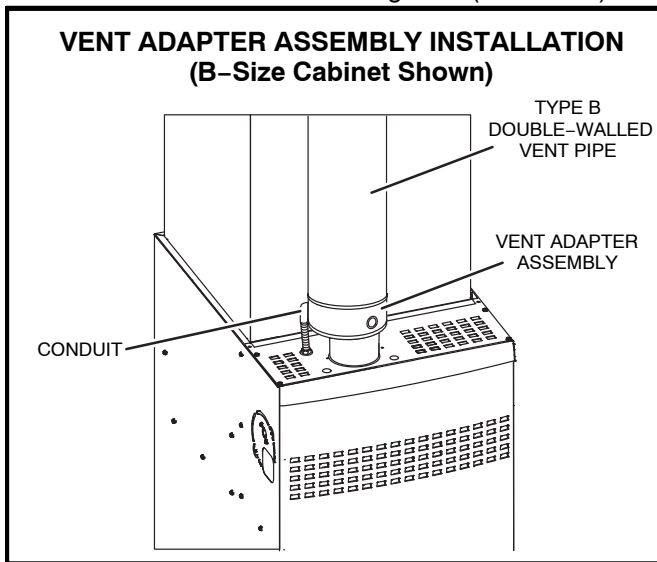
**NOTE - 80AF1UH and ML180UH models cannot use location A or the flange on the upper access door will interfere with the electrical conduit on the vent adapter.**

Location B is for 80AF1UH, ML180UH models with the following gas inputs: 045, 070, 110 and 135.

Location C is for 80AF1UH and ML180UH with 090 gas inputs and EL280UH and SL280UH models that are in B-size cabinets: EL280UH090P36B, EL280UH090P48B, SL280UH090V36B and SL280UH090V48B (see figure 4)

**NOTE - The louvers in the top cap on B-size cabinets will interfere with the electrical conduit on vent adapter if locations A and B are used. Make sure there is clearance to evaporator coil.**

- 3 - Position the vent adapter assembly on the furnace flue transition as shown in figure 4 (location C).



**FIGURE 4**

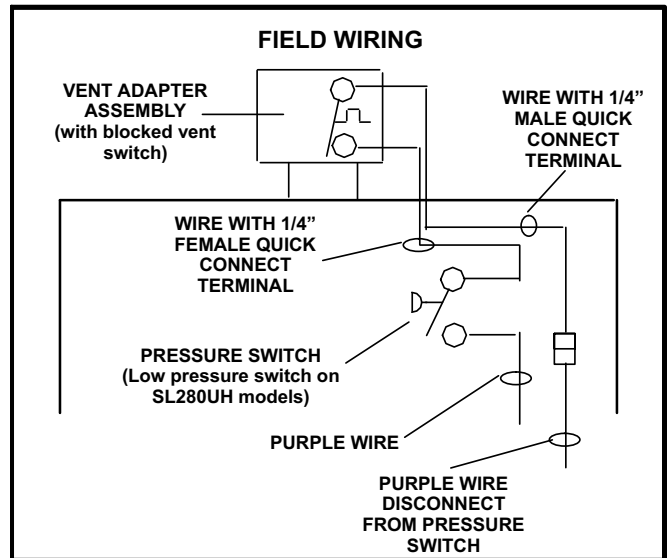
- 4 - Remove the locknut from the vent adapter assembly conduit. Route the two wires through the 7/8" hole in the furnace top cap. Use the locknut to secure the conduit to the furnace top cap.

- 5 - Use three field-provided, self-drilling sheet metal screws to firmly secure the vent adapter assembly to the round collar of the unit flue transition. Drive one self-drilling screw through the front and one through each side of the vent adapter assembly and collar.

## ⚠ WARNING

**Asphyxiation hazard. The vent adapter assembly must be securely attached to the furnace flue transition and the vent pipe at all times.**

- 6 - The vent adapter assembly includes a blocked vent switch which must be wired into the furnace combustion air proving pressure switch as shown in figure 5. This manually reset switch interrupts unit operation when the vent is blocked. The switch must not be reset until vent blockage is cleared.
- a - Remove one of the purple wires from the combustion air proving pressure switch. Connect this wire to the switch wire with the male 1/4" quick connect terminal.
  - b - Connect the switch wire with the female 1/4" quick connect terminal to the open contact on the combustion air proving pressure switch.



**FIGURE 5**

- 7 - Use three field-provided self-drilling screws to secure the double-walled B-vent to the top of the vent adapter assembly. Drive one self-drilling screw through the front and one through each side. Route the vent to the masonry chimney using the shortest possible route. If an elbow is required to route the vent connector to the chimney, it must be installed at least 1 ft. above the furnace vent outlet. A 2 ft. clearance before the first elbow is preferable. See figure 6.

## Common Venting Using Tile-Lined Masonry Chimney

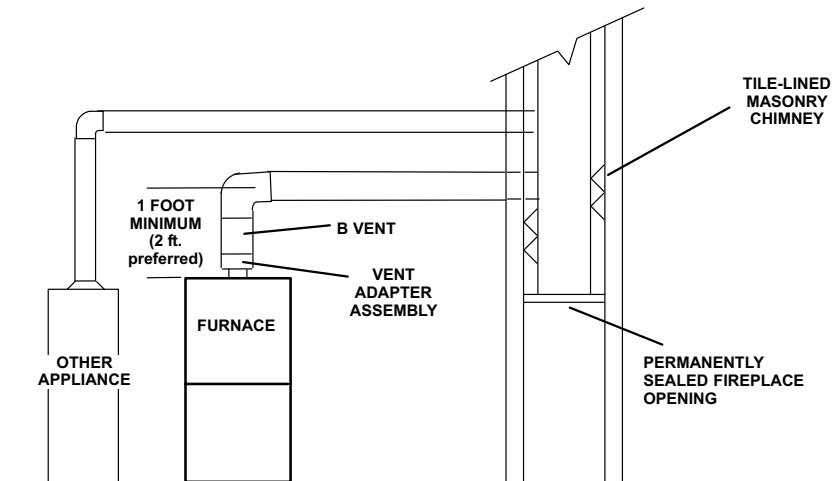


FIGURE 6

- 8 - When an exterior masonry chimney is being used, the furnace must be commonly vented with at least one other drafthood-equipped gas-fired appliance.
- 9 - Continue with furnace installation, start-up and adjustments as outlined in furnace installation instructions.

**NOTE - Furnace blower heating speed should be adjusted so that temperature rise is at the high end of the range listed on the unit rating plate.**

- 10 - Test the operation of the blocked vent switch.

**CAUTION - Ensure good ventilation of the area where the furnace is installed before performing this test.**

- a - Remove double-walled B-vent from top of vent adapter assembly.
  - b - Adjust room thermostat to signal heating demand.
  - c - Allow furnace to operate for 2 minutes, then completely cover the top of the vent adapter assembly outlet to simulate a vent blockage. Furnace should shut off within 2 minutes.
  - d - Remove blockage and **allow unit to cool for 5 minutes**. Press reset button on blocked vent switch. Reinstall double-walled vent pipe. Adjust thermostat to normal setting.
- 11 - Test the furnace for proper draft and spillage.
    - a - Inspect the venting system for proper size and horizontal pitch. Determine that there is no

blockage, restriction, leakage, corrosion, or other deficiencies which could cause an unsafe condition.

- b - Close all building doors and windows and all doors between the space in which the appliances remaining connected to the common venting system are located and other spaces of the building. Turn on clothes dryers and any appliances not connected to the common venting system. Turn on any exhaust fans, such as range hoods and bathroom exhausts, so they will operate at maximum speed. Do not operate a summer exhaust fan. Close fireplace dampers.
- c - Follow the lighting instructions. Turn on the appliance that is being inspected. Adjust the thermostat so that the appliance operates continuously.
- d - After the main burner has operated for 5 minutes, test for leaks of flue gases at the draft hood or vent adapter relief opening. Use the flame of a match or candle, or smoke from a cigarette, cigar, or pipe.
- e - After determining that each appliance connected to the common venting system is venting properly, (step 3) return all doors, windows, exhaust fans, fireplace dampers, and any other gas-burning appliances to their previous mode of operation.
- f - If a venting problem is found during any of the preceding tests, the common venting system must be modified to correct the problem.